Pioneer 145
INNOVATION BY NanoSUN

Mobile Hydrogen Refuelling Station

350BAR AUTOMATIC FLEXIBLE CASCADE REFUELLER

FAST TO DEPLOY
EASILY SCALABLE

FIND OUT HOW YOU COULD BENEFIT

FROM EASY TO DEPLOY, RAPID HYDROGEN REFUELLING

NanoSUN is a world leading, award-winning, engineering company focused on the development, manufacture and commercialisation of its hydrogen refuelling products.

Pioneer145 is a fully mobile, self-contained, and automated hydrogen refuelling station incorporating NanoSUN's proprietary multi-stage flexible cascade technology.

The system's combined storage, transportation and dispensing offers a low-cost, easy to deploy path of delivering transportation grade fuel to point of use.

Features & Benefits

Integrated solution
- Gas storage
- Gas transportation
- Gas dispensing

Mobile ability
- Fast to deploy
- Inherent reliability
- Easily scalable

Flexible refuelling protocols
- J2799 comms ready
- OIML certified mass flow measurement

No on-board compression
- Low power consumption
- Low CapEx enables small fleets of vehicles
- Low noise operation

Applications

Pioneer is designed for heavy duty vehicle applications:
- Buses
- Vans
- Trucks
- Construction
- Material handling
- Backup solutions to fixed stations

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Pioneer145 Specifications

PHYSICAL	**Weight**	24 tonnes (tare)
	Container	• Standard 20" high cube ISO container format (6.10m x 2.44m x 2.90m) • Steel construction painted finish to ISO12944 Type C3
	Vent Stack	• Vent stack height 2m (from roof of container) • Self-erecting vent stack (folds flat for transportation)
OPERATION	**Temperature Limits**	Ambient operating temperatures: -10°C to +40°C
	Primary Power Supply	230V/16A AC single phase and 24V DC Ceeform inlet connectors (IEC 60309). ~500W power for operation
	Back-up Power Supply	100Ah battery backup (24V) – runtime without power circa 5 hours (dependent on ambient temperature)
HYDROGEN STORAGE	**Type 4 Pressure Vessels (x 9)**	• 425 bar maximum storage pressure • ~15,000L water volume • Up to 420kg hydrogen stored at maximum pressure
	Cylinder Valves	TPED manual cylinder valves on each pressure vessel
HYDROGEN MANIFOLD & DISTRIBUTION	**Pioneer Fill Port (and decant outlet)**	• Walther Präezision quick coupler, HP006, Male plug • Maximum fill rate 2.6kg/minute • PLC controlled distribution to cylinders via main manifold
	Pioneer Filling (and decant outlet)	Optional "Smart Tube Trailer" mode available to allow decanting from cylinders
	Vehicle Refuelling Connection	WEH TK16 standard H35 refuelling nozzle (self-venting) • 5 meters in length • SAE J2600 approved • SAE J2799 IR connection comms ready • TSA1 H2 Breakaway coupling
	Refuelling Temperature	Refuelling is carried out at ambient temperature (with sensor)
	Refuelling Temperature Management	Maximum dispensing rate 3.6kg/minute
		Dispensing rates, comms & non-comms conformance to: • Toyota/CEP H35 Protocol • SAE J2601:2010 Protocol • Custom protocols can be programmed
CONTROL SYSTEM & ELECTRICAL	**Remote Monitoring**	Remote notification of activity via cellular connection: • Status & location • Pressure in each Pioneer cylinder • Battery voltage • Alarm, faults, ESD alerts • Ambient temperatures • Option for 3rd party data integration
	Gas Metering	OIML certified Coriolis mass flow meter for vehicle refuelling connection
	Safety Systems	• Backup PLC for monitoring refuelling safety • Independent safety relays • Hydrogen monitor & heat detectors • Independent TPRD system • External emergency stop buttons
REGULATORY & STANDARDS COMPLIANCE	**CE & UKCA Marking**	Compliant with all relevant European directives
	ADR & Transportable Pressure Equipment Directive	Fully type approved to TPED 2010/35/EU & ADR
		• EN 12245: Transportable gas cylinders. Fully wrapped composite cylinders • EN 13807: Transportable gas cylinders. Battery vehicles and multiple-element gas containers (MEGCs). Design, manufacture, identification, and testing
	Explosive Atmospheres Directive	• Separation between high pressure hydrogen and control equipment • ATEX 2014/34/EU • EN 60079: Explosive Atmospheres • DSEAR compliant (UK)
	Additional Standards	All relevant BCGA & EIGA guidance

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